

## CLAIMS

What is claimed is:

1. A computer implemented method for creating minimal data representing a source image, comprising the steps of:
  - 5 dividing the source image into a grid of cells;
  - selecting a color for each cell corner based on sampling an area defined by the cell corner; and
  - storing an indication of the selected color in an array dependent on the co-ordinates of the cell corner in the source image.
- 10 2. The method of claim 1 further comprising the step of:
  - marking a region of critical importance in the source image.
- 15 3. The method of claim 2 wherein the region of critical importance is dependent on flight path and current position of an aircraft.
4. The method of claim 2 wherein a dimension of a cell is dependent on distance of the cell from the region of critical importance.
- 20 5. The method of claim 1 wherein each cell in the grid of cells is a square.
6. The method of claim 1 wherein upon detecting a plurality of colors at a cell corner, the color value of highest value is selected for the cell corner.
- 25 7. A weather imagery system which creates minimal data representing a source image comprising:
  - means for dividing the source image into a grid of cells;

means for selecting a color for each cell corner based on sampling an area defined by the cell corner; and  
an array which stores an indication of the selected color dependent on the co-ordinates of the cell corner in the source image.

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8. A computer implemented method for generating an image from minimal data, comprising the steps of:

populating an array for the image by reading color values of cell corners from a received data stream and assigning the values to the array;  
10 duplicating source cells used to create the minimal data; and  
rendering the cells dependent on the received values for the corners of the cell.

9. The method of claim 8 wherein the step of rendering further comprising the  
15 steps of:

testing each cell for transition zones;  
upon detecting a transition zone, computing temporary mid-points and treating the cell as being divided.

- 20 10. The method of claim 8 wherein the step of rendering further comprising the steps of:

selecting a color value for a cell based on the result of an interpolation function performed based on the color values of the corners of the cell.

- 25 11. A computer implemented method for transmission and display of a source image comprising the steps of:

selecting an array of sample points defining a voronoi region in a source image;

- computing a representative value from image pixels in each voronoi region;
- quantizing the representative values;
- compressing the quantized values;
- transmitting the compressed values over a communications medium to a display system;
- reconstructing the array of sample points in the display system; and
- reconstructing the source image based on the array of sample points.
- 10    12. The method of claim 11 wherein the step of compressing is performed using a lossless compression algorithm.
- 15    13. The method of claim 12 wherein the lossless algorithm is a 2.33 bit compression algorithm.
14. The method of claim 12 wherein the lossless algorithm is a one-byte run length encoding compression algorithm.
15. The method of claim 12 wherein the lossless algorithm is a knowledge based compression algorithm.
- 20    16. A computer implemented method of delivering graphical weather images through a satellite to an aircraft comprising the step of:  
            automatically transmitting an updated graphical weather image for display to the aircraft based on flight plan.
- 25    17. The method of claim 16 wherein the updated graphical weather image is transmitted upon detecting relevant weather.

18. A computer implemented method of delivering graphical weather images through a satellite to an aircraft comprising the steps of:
  - determining an expected position of the aircraft based on a flight plan;
  - and

5                   automatically transmitting to the aircraft an updated graphical weather image covering the expected position of the aircraft.
19. The method of claim 18 wherein the updated image is transmitted based on severity of the weather in a source weather image.
- 10                 20. The method of claim 18 wherein the updated graphical weather image is created by:
  - dividing a source image into a grid of cells;
  - selecting a color for each cell corner based on sampling an area defined by the cell corner; and

15                   storing an indication of the selected color in an array dependent on the co-ordinates of the cell corner in the source image.